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APPLICATION NUMBER: *60/513,361*
FILING DATE: *October 22, 2003*
RELATED PCT APPLICATION NUMBER: *PCT/US04/34770*

Certified by

Jon W Dudas

Acting Under Secretary of Commerce
for Intellectual Property
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PTO/SB/16 (08-03)
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV 287981993 US

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Harry	Leneau	Jasper, MO
Judith	Leneau	Jasper, MO
Steven	Allday	Shelbyville, KY

☐ *Additional inventors are being named on the ____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (500 characters max)

Colostrum Compositions and Methods

15535 U.S. PTO 60/513361 10/22/03

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* **9**

☐ Drawing(s) *Number of Sheets*

☐ Application Data Sheet. See 37 CFR 1.76

☐ CD(s), Number

☒ Other (specify) **Postcard**

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☒ Applicant claims small entity status. See 37 CFR 1.27.

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FILING FEE AMOUNT ($) **$80.00**

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE _____

Date **10/22/03**

REGISTRATION NO. *(if appropriate)* **42,088**

Docket Number: **29792-73465**

TYPED or PRINTED NAME **Jill T. Powlick**

TELEPHONE **317-231-7504**

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Provisional Application,**

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☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) **$80.00**

Complete if Known	
Application Number	Unknown
Filing Date	Herewith (Oct. 10, 2003)
First Named Inventor	Harry Leneau et al.
Examiner Name	Unknown
Art Unit	Unknown
Attorney Docket No.	29792-73465

METHOD OF PAYMENT *(check all that apply)*

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FEE CALCULATION

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1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	80.00

SUBTOTAL (1) ($) **$80.00**

2. EXTRA CLAIM FEES FOR UTILITY AND

	Extra Claims		Fee from below	Fee Paid
Total Claims	-20** =	0	X	= 0.00
Independent Claims	- 3** =	0	X	= 0.00
Multiple Dependent				=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) **$0.00**

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FEE CALCULATION (continued)

3. ADDITIONAL FEES

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1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non - English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR § 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Statement	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
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Other fee (specify) _____

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SUBMITTED BY

Complete (if applicable)

Name (Print/Type)	Jill T. Powlick	Registration No. (Attorney/Agent)	42,088	Telephone	317-231-7504
Signature				Date	October 22, 2003

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11 South Meridian Street
Indianapolis, Indiana 46204
(317)236-1313

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group:	Unknown
Attorney Docket:	29792-73465
Applicant:	Harry Leneau et al.
Invention:	COLOSTRUM COMPOSITIONS AND METHODS
Filed:	Herewith (October 22, 2003)
Examiner:	Unknown

CERTIFICATE UNDER 37 C.F.R. § 1.10

Mail Stop Provisional Patent Application
Commissioner for Patents
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Date of deposit:	October 22, 2003

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Enclosure
Indianapolis, Indiana
(317) 231-7820
INDS02 JTP 615844v1

Express Mail No. EV 287981993 US

PROVISIONAL PATENT APPLICATION

of

HARRY LENEAU

JUDITH LENEAU

And

STEVEN ALLDAY

for

COLOSTRUM COMPOSITIONS AND METHODS

Attorney Docket 29792-73465

COLOSTRUM COMPOSITIONS AND METHODS

FIELD OF THE INVENTION

The present invention relates to a composition and method for providing protection against pathogens. More particularly, this invention provides compositions comprising colostrum for use in providing protection against pathogens.

BACKGROUND AND SUMMARY OF THE INVENTION

Bovine Respiratory Disease Complex (BRD) is a multivalent disease of cattle, one segment of which is known as "shipping disease." BRD is caused by both viral and bacterial pathogens, and more than 20 different viruses and approximately six common bacterial pathogens are associated with the disease. Typically, the bacterial challenges follow a viral challenge. Illustrative viral pathogens include Infectious Bovine Rhinotracheitis (IBR), Bovine Viral Diarrhea (BVD), Parainfluenza 3 (PI-3), and Bovine Respiratory Syncitial Virus (BRSV).

Colostrum is a substance secreted in the first few days post-partum prior to onset of true lactation. Colostrum contains proteins, carbohydrates, fats, vitamins, and minerals. In addition, colostrum contains bioactive components such as growth factors and antimicrobial factors. The antimicrobial factors include immunoglobulins, lactoperoxidase, lysozyme, and lactoferrin. Bovine colostrum is extremely rich in immunoglobulins. The concentration of IgG1 (52-87 g/l), IgG2 (1.6-2.1 g/l), IBM (3.7-6.1 g/l), and Riga 3.2-6.2 g/l) in bovine colostrum is approximately 100 fold higher than in normal bovine milk. Colostrum is routinely provided to calves, both for its nutritional and its antimicrobial effects. However, colostrum, by its nature, is not a sterile product, and its use has been generally limited to oral ingestion.

The present invention is directed to a colostrum product and a method of using the colostrum product. The colostrum product may be filtered and sterilized, and may be injected, illustratively subcutaneously and intravenously. Subcutaneous and intravenous injections of filtered sterile colostrum have been demonstrated to provide beneficial effects against Infectious Bovine Rhinotracheitis (IBR), Bovine

Viral Diarrhea (BVD), Parainfluenza 3 (PI-3), and Bovine Respiratory Syncitial Virus (BRSV).

Additional features of the present invention will become apparent to those skilled in the art upon consideration of the following detailed description of the preferred embodiments.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with the present invention, a method is provided for providing an animal protection against pathogens. The method comprises delivering to the animal by injection a composition comprising an effective amount of a colostrum product. An "effective amount" as used herein refers to the amount of colostrum product which, upon injection, provides protection against pathogens. The colostrum product is illustratively colostrum that has been sterilized to provide a product that meets acceptable sterility requirements for injection. The colostrum used to make the colostrum product is also illustratively filtered to remove large components to provide a composition that is more compatible with injection. The animal illustratively may be a warm-blooded vertebrate, illustrative a bovine, ovine, equine, or porcine species, and the pathogens may be pathogens frequently encountered in commercial farming, breeding, or raising of the animal species. In one illustrative embodiment, the animal is a bovine calf, and the method is used to provide protection against IBR, BVD, PI-3, or BRSV. Illustratively, the colostrum is obtained from a post-partum female of the same species. However, it is understood that the colostrum product may be obtained from an animal of one species and used to provide protection to an animal of another species. Furthermore, it is understood that the animals discussed herein are illustrative only, and the colostrum product may be used to provide protection to other animals, particularly other warm-blooded vertebrates. Illustratively, the colostrum product may be used independently, or may be used in conjunction with a vaccination protocol.

EXAMPLES

Example 1: Preparation of Sterile Highly Filtered Bovine Colostrum

Colostrum was obtained from Grade A dairy herds. The raw colostrum is filtered through a series of filters, illustratively starting with a 10 micron filter, followed by a 5 micron filter, and finishing with a 3 micron filter. Illustratively Millipore® filters (Billerica, MA) with polyester felt filter bags are used. The filtration removes large components, such as aggregates of lipids, proteins, and other materials, which may interfere with absorption or may result in sterile abscesses. Other filtration protocols, as are known in the art, may be used to remove the large components.

The filtered colostrum is packaged in containers and frozen. Sterilization is accomplished by 1.0 to 4.5 Mrad gamma-irradiation. Illustratively, the sterilization takes place on frozen or highly refrigerated colostrum, to prevent or minimize denaturation. While gamma-irradiation is used for sterilization of the illustrated embodiment, other methods of sterilization are contemplated and are within the scope of this invention. Such other methods include, but are not limited to, UV light and heat. Such methods may be time and/or temperature sensitive. Illustratively, the sterile product would be provided refrigerated.

Immunoglobulin levels in the sterile highly filtered colostrum were obtained from an independent lab (VMRD, Inc., Pullman, WA). IgG, IgA, and IgM levels do not vary significantly from those of the raw colostrum, as follows:

	Raw Colostrum (mg/100ml)	Sterile Filtered Colostrum (mg/100ml)
IgA	250	240
IgG	4200	3700
IgM	190	170

These immunoglobulin levels are much higher than the serum immunoglobulin levels prior to treatment of the calves of the test group discussed below.

Example 2: Preparation of Composition

The sterile highly filtered colostrum was packaged without a carrier. However, standard carriers and exipients, as are known in the art may be used.

Dosages of 1 µl to 1000 ml may be provided, preferably, about 0.1 to 100 ml, most preferably about 25 to 75 ml. Dosages may be adjusted due to the size and species of the animal. In calves, a dose for a newborn animal may be 20-40 ml; in a 200-400 lb animal a dose of 40-60 ml may be used, and in larger calves of > 400 lbs, a single dose of 100 ml may be provided, or several doses of 100 ml may be provided in multiple sites. Illustratively a dose of 50 ml is used.

Example 3: IBR Viral Challenge Subsequent to Subcutaneous Injection

Ten calves were used in this study. The calves were observed for ten days prior to commencement of the study, to insure that each calf is healthy.

Day 1: blood samples for viral titers were obtained, nasal swabs were obtained, and each calf was ear tagged. The calves were divided into two groups of five calves each. Each of the five calves in the test group were given a subcutaneous injection of 50 cc of the colostrum as prepared in Example 1. Each of the five calves in the control group were given a subcutaneous injection of 50 cc of fetal bovine serum, which was free of immunoglobulins.

Day 2: all ten calves were challenged with a live viral mixture containing IBR. 3.0 cc of the live virus was introduced into each nostril.

Days 3-8: nasal swabs were obtained from both sides of the nasal cavities of each calf. Each day the viral swabs were placed in viral transport medium, kept cold, and shipped overnight to the laboratory.

IBR virus shedding was reduced by 72% in the test group animals, as compared to the control animals. No test animals required any antibiotic treatment for symptoms. Among the control animals, one calf required no antibiotic treatment, three calves required two days of treatment, and one calf required four days of treatment.

The results of this study demonstrated a significant reduction in IBR virus shedding, as well as a significant reduction in symptoms.

Example 4: BVD Viral Challenge Subsequent to Subcutaneous Injection

This study was performed in the same manner as the study of Example 3, except that 3.0 cc of BVD was introduced into each nostril.

BVD virus shedding was reduced by 63% in the test group animals, as compared to the control animals. No test animals required any antibiotic treatment for symptoms. Among the control animals, one calf required two days of treatment, four calves required two days of treatment, and one calf required four days of treatment.

The results of this study demonstrated a significant reduction in BVD virus shedding, as well as a significant reduction in symptoms.

Example 5: PI-3 Viral Challenge Subsequent to Subcutaneous Injection

This study was performed in the same manner as the study of Example 3, except that 3.0 cc of PI-3 was introduced into each nostril.

PI-3 virus shedding was reduced by 81% in the test group animals, as compared to the control animals. One test animal required two days of antibiotic treatment. None of the other four test animals required any antibiotic treatment for symptoms. Among the control animals, all five calves required two days of treatment.

The results of this study demonstrated a significant reduction in PI-3 virus shedding, as well as a significant reduction in symptoms.

Example 6: BRSV Viral Challenge Subsequent to Subcutaneous Injection

This study was performed in the same manner as the study of Example 3, except that 3.0 cc of BRSV was introduced into each nostril.

BRSV virus shedding was reduced by 11% in the test group animals, as compared to the control animals. No test animals had any symptoms and none required any antibiotic treatment. Among the control animals, two calves had no symptoms and required no antibiotic treatment, two control group calves had elevated temperatures of 102-104°F and loss of appetite for two days, and one control group calf had elevated temperatures of 103-104°F and loss of appetite for two days.

The results of this study demonstrated a significant reduction in BRSV virus shedding, as well as a significant reduction in symptoms.

Although the invention has been described in detail with reference to certain preferred embodiments, those skilled in the art will recognize that the invention can be practiced with variations and modifications within the scope and spirit of the invention as described and defined in the following claims.

CLAIMS:

A1. A composition comprising sterile bovine colostrum that has been highly filtered.

A2. The composition of claim A1 provided in injectable form.

A3. The composition of claim A2 provided in a syringe.

A4. The composition of claim A2 further comprising a carrier suitable for injection.

B1. A method of preparing sterile highly filtered colostrum comprising the steps of

filtering colostrum to remove large components while retaining antibodies, and

sterilizing the colostrum.

B2. The method of claim B1 wherein the sterilizing step is performed by gamma irradiating the sample.

B3. The method of claim B1 wherein the filtering step is performed by filtering the colostrum through a series of filters.

B4. The method of claim B3 wherein the series of filters comprises a 10 micron filter, a 5 micron filter, and a 3 micron filter.

C1. A method for providing an animal protection from disease comprising the step of

injecting animal with a dose of colostrum.

C2. The method of claim C1 wherein the colostrum is sterilized.

C3. The method of claims or C2 wherein the colostrum is highly filtered.

C4. The method of claim C1 wherein the animal is a warm-blooded mammal.

C5. The method of claim C4 wherein the warm-blooded mammal is a bovine.

C6. The method of claim C5 wherein the bovine is a calf.

C7. The method of claim C4 wherein the warm-blooded mammal is a juvenile.

C8. The method of claim C4 wherein the colostrum is obtained from an animal of the same species as the warm-blooded mammal.

C9. The method of claim C1 further comprising the step of injecting the animal with a second dose of colostrum at a subsequent date.

ABSTRACT

Colostrum products and a methods of using the colostrum products are provided. Methods are provided for preparing the colostrum products, which may be filtered and sterilized. The colostrum products may be injected, illustratively subcutaneously and intravenously, to provide an animal protection from disease.

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